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## A study on complications, surgical management and its outcome with varicose veins in lower limbs

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### Abstract:

**Background:** Varicose veins are a common clinical condition affecting the lower limbs. Usually patient comes for a cosmetic problem; it can cause complications giving rise to significant morbidity if not treated in time. Different options are available for surgical management.

**Aim & Objective:** The present study mainly investigates the complications, surgical management and its outcome with varicose veins in lower limbs.

**Methodology:** We include 80 patients over a two year period all admitted patients to a Princess Esra Hospital, Shahali Banda, Hyderabad and Owasi Hospital and Research Centre, Kanchan Bagh, Hyderabad from period June 2017-June 2019.

**Results:** In the present study showed long saphenous system involvement in 72.5% of cases. Majority of patients in the present series were patients of CEAP class 2 and 3 class. Almost 73.75 % had combined saphenofemoral and perforator incompetence. In the present study, underwent duplex USG evaluation for confirmation of diagnosis. This investigation was required to accurately diagnose 18 cases of saphenofemoral incompetence, 10 cases of saphenopopliteal incompetence and 12 cases of perforator incompetence. Most of the patients had wound infections followed by hematoma and residual varicosity.

**Conclusion:** From this study we conclude that commonest age group affected is 21-40 years. The involvement of long saphenous and communicating system is commonest followed by long saphenous involvement alone. Pain is the commonest symptom. Patients with involvement of long saphenous and communicating system or long saphenous and short saphenous involvement were more symptomatic than the others. Commonest complication in post-operative treatment is wound infection. Complications of varicose veins responded well to operative treatment.

**Keywords:** Long Saphenous, Complications, Management, Ultrasonography, Varicose veins

### Introduction

Varicose vein is a dilated, elongated, tortuous and often palpable superficial venous system of the body especially of the lower extremities. Other commoner areas are the umbilicus (Capus medusa), scrotum/ vulva (varicocele) and rectum (haemorrhoids) [1]. They can be found in the upper extremities along the distributions of the cephalic and basilica veins, though rarely. Visible varicose veins in the lower extremities are estimated to affect at least a third of the population [2] and 28.6% of people with varicose veins progressed to develop serious venous diseases. Also 3-6% of people with varicose veins in their life time progress to develop venous ulcers [3, 4].

The incidence of chronic varicose veins were associated with several predisposing factor such as age, sex, and geographical locations. Extrinsic environmental factors and intrinsic pathological conditions contribute to the disease, including family history, obesity, older age, pregnancy and female gender [7]. Currently preoperative diagnosis of varicose veins by Doppler ultrasonography. Current treatment procedures are divided into conservative and surgical. The conservative methods are leg elevation, exercise, bandaging and massage, generally referred to as Bisgaard regime. The surgical methods are high ligation, multiple ligation and stripping, endovenous laser ablation (EVA), sclerotherapy and ambulatory phlebectomy Varicose veins caused by due to the incompetent perforators, incompetent valves of the superficial veins, deep vein thrombosis, atriovenous fistula (AVF) and pelvic mass (es) like pregnancy, tumours obstructing blood flow towards the heart. Other causes include family history and idiopathic. The main objective of the present study is to investigate the complications, surgical management and its outcome with varicose veins in lower limbs

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## Materials and Methods

### Study Type

It is prospective observational study

### Study Population and Data collection

Total 80 patients were included in the present study. 80 cases of primary varicose veins of long saphenous vein with or without perforator in competence who got treated by either simple ligation or ligation with stripping of long saphenous vein from the period of June '2017 to June '2019 at Princess Esra Hospital, Shahali Banda, Hyderabad and Owasi Hospital and Research Centre, Kanchan Bagh, Hyderabad.

### Inclusion criteria

Patients with primary varicose veins of long saphenous vein with incompetent sapheno femoral junction with or without thigh perforators and with or without below knee perforators.

### Exclusion criteria

1. Patients with secondary varicose veins.
2. Patients with short saphenous vein varicosities.
3. Patients with long saphenous vein varicosities without sapheno femoral incompetence.

All patients were operated in Elective theatres with aseptic precautions under spinal / epidural / general anaesthesia. No local anesthesia was used patients were treated in Post-Operative Ward for the 1<sup>st</sup> postoperative day and shifted to General Wards to General Wards on 2<sup>nd</sup> post operative day.

All patients were applied Elastocrepe Bandage immediately after surgery and the bandage was removed after 48 hours for wound inspection and reapplied. Patients were encourage ambulation only after 48 hours and were instructed to contract the leg and dorsiflex the foot against the railing of the bed.

All stripping were done from groin to just below knee level only upto medial maeolus all below knee perforators and varicosities were treated in the same day in both groups by perforator ligation and multiple phlebectomies.

All patients were thoroughly assessed for complications and were discharged after suture removal with instructions to attend surgical OPD 1 months and 3 month after surgery. After a minimum of 3 months of follow up with a mean of 5.6 months the patients were assessed both clinically and sono-graphically and the results were tabulated.

### CEAP – Classification of lower limb varicose veins (2004)

C – Clinical Classification

E – Etiological Classification

A – Anatomic Classification

P – Pathophysiological classification

C – Clinical classification – 7 clinical grades have been identified

Class 0 – No visible (or) palpable sign of venous disease

Class 1 – Telangiectasis (or) Reticular veins (or) Malleolar flare

Class 2 – Varicose veins

Class 3 – Edema without skin change

Class 4 – Skin change (pigmentation, eczema or Lipodermatosclerosis

4a – Pigmentation

4b – Lipodermatosclerosis, atrophiablance

Class 5 – Skin change defined above with healed ulceration

Class 6 – Skin change defined above with active ulceration

Various investigations can be performed to know the condition of the deep vein, position of the incompetent perforators.

### ▪ Routine investigations

### ▪ Specific investigations

Numerous imaging and non-imaging methods have been developed to aid clinicians with this diagnostic problem. These methods can be divided arbitrarily into three main categories.

### 1. Non-invasive, Non-imaging, Physiologic Methods

A. Plethysmographic techniques

B. Continuous wave Doppler ultrasonography

### Handheld doppler studies

Handheld Doppler (HI-ID), also known as continuous wave (CWD), is increasingly eplacing the use of tourniquet (Trendelenberg, Perthes) tests in the clinic. It is uick, easy to learn, non-invasive and inexpensive.

### Colour doppler

The Doppler is an ideal non-invasive vascular diagnostic method which has a high overall accuracy. It is safe, a traumatic, comfortable to the patient, can be performed quickly and repeated and does not require bulky equipment or long procedures.

1. Doppler spectrum plus grey scale imaging (B mode) is duplex scan.
2. Doppler spectrum + Grey scale imaging + Colour is ripple scan (Colour Doppler).

## Results and Discussion

**Table 1:** Venous System Involvement

| System Involved | Limbs | %     |
|-----------------|-------|-------|
| Long saphenous  | 58    | 72.5  |
| Short saphenous | 16    | 19.75 |
| Both            | 06    | 7.5   |

**Table 2:** Clinical Class of CEAP

| Class | Limbs | %    |
|-------|-------|------|
| 0     | -     | -    |
| 1     | -     | -    |
| 2     | 34    | 42.5 |
| 3     | 20    | 25   |
| 4     | 12    | 15   |
| 5     | 04    | 05   |
| 6     | 10    | 12.5 |

**Table 3:** Site of incompetence

| Site of incompetence                           | No of Limbs | %     |
|--|-------------|-------|
| Saphenofemoral junction                        | 24          | 30    |
| Saphenofemoral + perforator                    | 20          | 25    |
| Perforator                                     | 10          | 18.75 |
| Saphenopopliteal                               | 12          | 15    |
| Saphenofemoral + sapheno poplital + perforator | 14          | 17.5  |

**Table 4:** Utilization of Ultrasonography for accurate Diagnosis

| Site of Incompetence                   | Requirement of Ultrasonography for Diagnosis |
|--|--|
| Sapheno femoral junction incompetence  | 18   |
| Saphenopopliteal junction incompetence | 10   |
| Perforator incompetence                | 12   |

**Table 5:** Surgical Management options

| Operation                                | No. of cases |
|--|--------------|
| Trendlenberg operation                   | 50           |
| Trendlenberg operation +stripping of lsv | 30           |
| Total                                    | 80           |

**Table 6:** Complications of varicose veins

| Complications         | Patients | Percentage |
|-----------------------|----------|------------|
| Wound infection       | 10       | 12.5       |
| Haematoma             | 04       | 5          |
| Residual varicosity   | 02       | 2.5        |
| Saphenous neuritis    | 01       | 1.25       |
| Femoral vein injury   | 01       | 1.25       |
| Femoral artery injury | 02       | 2.5        |
| Deep vein thrombosis  | 02       | 2.5        |
| Pulmonary embolism    | 01       | 1.25       |

In the present study showed long saphenous system involvement in 72.5% of cases. Our studies are similar with the study conducted by Al-Mulhim *et al.* [8] of Saudi Arabia, it was 68.42%. Both systems were involved in 6.25% of cases and isolated short saphenous vein was involved in 3.13% of cases.

The present study showed majority of patients in the present series were patients of CEAP class 2 and 3 which included patients presenting with only varicose veins and patients with limb oedema which is comparable to study done by Stuart WP series. The patients seeking medical help for uncomplicated varicose veins in present study were 40% [9].

The present study found that Majority of the patients in the present study had incompetence at multiple sites. Almost 73.75 % had combined saphenofemoral and perforator incompetence.

All the patients in the present study underwent duplex USG evaluation for confirmation of diagnosis. This investigation was required to accurately diagnose 18 cases of saphenofemoral incompetence, 10 cases of saphenopopliteal incompetence and 12 cases of perforator incompetence.

In the present study majority of the patients had wound infections followed by hematoma and residual varicosity.

### Surgical Management options

Out of the 58 limbs involved — 24 cases were managed by ligation of the sapheno femoral junction alone and 20 cases were managed by ligation combined with stripping of the long saphenous vein from groin to just below knee level.

In the group that underwent ligation alone, thigh perforators were present in 62.5% cases whereas in the group that underwent ligation combined with stripping thigh, perforators were present in 61.1% of cases. After surgery residual long saphenous vein reflux was present in 37.5% cases in the group in which ligation alone was done and residual thigh perforators were identified in 40% of cases whereas in the group which underwent ligation combined with stripping of the thigh segment of long saphenous vein residual reflux was present in 11.1% cases and no residual thigh perforators were identified.

The benefit of stripping the long saphenous vein from groin to upper calf probably derived from disconnection of mid-thigh communicating results. Of the post operative complications compared the incidence of hematoma and wound infection were the same in both the groups. There was no recorded case of intra operative bleeding or saphenous nerve palsy in both the groups. 1 case of limb edema was recorded in the group in whom the long saphenous vein was stripped. This was not due to deep vein thrombosis as ruled out by duplex ultrasound and was managed conservatively by crepe bandage and limb elevation.

A follow-up period of 3 months was selected because it has been showed that limbs without reflux in the residual part of long saphenous vein 3 months after surgery are more likely to be free from clinical recurrence at 21 months.

The present study demonstrates that the results of surgery for primary varicose veins 3 months after surgery in the distribution of long saphenous vein are improved by addition of long saphenous vein stripping from groin to just below knee level to the standard operations of sapheno femoral ligation and multiple avulsions.

### Treatment of Varicose veins

In our study period, all patients had Doppler and duplex scanning as a mandatory preoperative workup. Those with chronic DVT were excluded from surgery. Many years ago in our institution prior the study period, Trendelenburg, Perthes, Linton, Schwartz tests including cough tests, Pratt test and Fegan method were used in making diagnosis of varicose veins. Several studies, have however validated the inaccuracy of these battery of acronym of tests [10, 11].

In our study, treatment was divided into conservative and surgical. The conservative treatment used was the Bisgaard regime (bandaging, elevation, exercise, massage, antibiotics). This treatment was done for all patients preoperatively and continued in the postoperative period.

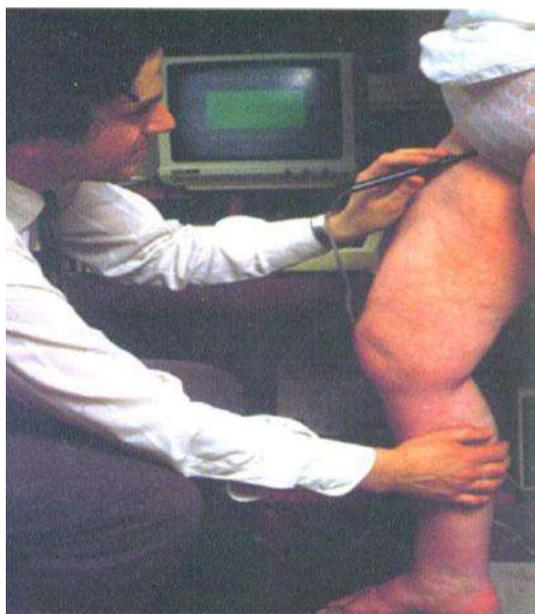
The traditional surgical procedures in our study included ligations (multiple, subfascial, flush). Other methods were stripping and injection sclerotherapy, using tetracyclins-saline solutions. In other studies, limb elevation was advised in 29.4%. Such protective measures help to reduce and relieve associated symptoms [12, 13].

In our study combination of treatment was used including, ligations, stripping, and skin grafting. Other studies are in agreement with ours, because there it was shown that combination of high ligation, division and stripping and multiple stab avulsions were the gold standard for varicose vein surgery [14, 15]. Other newer modes of treatment are technologically driven and they include radiofrequency ablation, endovenous laser treatment and endovenouslaser ablation [16]. These were not used in our study because we are a developing country, deficient in the high tech-equipment and expertise.

**Fig 1:** Class I (Reticular vein)



**Fig 2:** Class II (Varicose vein)



**Fig 3:** Colour Doppler US Scan

### Conclusion

Varicose veins are a pathology that is relatively common among the youth and middle age groups. Predisposing factors are varied especially the primary types. At present, Doppler and duplex ultrasound scanning is the most reliable investigative tool in making diagnosis of varicose veins in terms of valve incompetence along GSV and SSV, deep vein thrombosis and perforator incompetence. Treatment is both conservative and surgical, with conservative providing effective roles in all forms of varicose veins.

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**Conflict of Interest:** None

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